

## **CLAIMS:**

1. A system for monitoring compliance with an advertising program comprising:
  - a backscatter tag associated with a sign that is placed in a specific location in accordance with a particular advertising program;
  - a backscatter reader that receives tag data from the backscatter tag; and
  - a computer that communicates with the backscatter reader and analyzes the tag data to determine whether the sign is in compliance with the particular advertising program.
2. The system of claim 1, wherein:
  - the tag data includes sign identification data; and
  - the computer uses the sign identification data to determine whether the sign is in compliance with the particular advertising program.
3. The system of claim 1, wherein the backscatter tag detects whether the sign is present in the specific location and sends a signal to the backscatter reader.
4. The system of claim 1, wherein:
  - the backscatter tag is a contact backscatter tag; and
  - the backscatter reader is a contact reader.
5. The system of claim 1, wherein the tag is in abutting relationship with the sign.
6. The system of claim 1, wherein the tag is affixed to the sign.
7. The system of claim 1, wherein:
  - the sign includes a displayed price;

the tag monitors the displayed price;  
the tag sends tag data including the displayed price to the reader; and  
the computer determines whether the displayed price is in compliance with the particular advertising program.

8. The system of claim 1, wherein the backscatter tag is associated with a consumer carried card, the computer determining the number of consumers that pass within range of the backscatter reader.

9. The system of claim 1, wherein the sign is selected from the group consisting of marketing materials, displays, pricing information, coupon dispensers, signage, display racks, floor mats, counter mats, containers, promotional hardware, shopper identification cards, seasonal promotions, and products.

10. The system of claim 1, wherein the backscatter tag includes a transmitter, a receiver, and a memory for storing the tag data.

11. The system of claim 10, wherein the backscatter tag is a passive tag that receives energy from a close proximity external source.

12. The system of claim 1, wherein the backscatter tag includes a microcontroller and a power source, the tag awakening periodically to send tag data to the backscatter reader.

13. The system of claim 1, wherein a plurality of signs are located in a store in specific locations according to the particular advertising program.

14. The system of claim 13, wherein the computer determines whether a particular one of the signs is actually present in its specific location in compliance with the particular advertising program.
15. The system of claim 1, wherein a backscatter reader periodically awakens to detect the tag data transmitted by one or more backscatter tags.
16. The system of claim 1, wherein the backscatter tag is in physical contact with the sign.
17. The system of claim 1, wherein the sign includes sign identification indicia.
18. The system of claim 17, wherein the sign identification indicia is selected from the group consisting of conductive ink, magnetic ink, optical indicia, and notch indicia.
19. The system of claim 18, wherein the backscatter reader reads the sign identification indicia via an optical scanner.
20. The system of claim 17, wherein the sign identification indicia is stored in a EEPROM chip.
21. The system of claim 1, wherein the backscatter tag is an active tag that transmits tag data in response to an interrogation signal from an associated backscatter reader.
22. The system of claim 21, wherein the active tag uses sleep modes to conserve power.
23. The system of claim 21, further comprising a switch associated with the backscatter reader that is normally in a first position when the backscatter reader is in a specific location with respect to the sign and in a second position when the backscatter reader is not present in the specific location, the backscatter reader monitoring the position of the switch and causing a

signal to be transmitted if the switch changes position, the signal indicating that the backscatter reader has been moved.

24. The system of claim 23, wherein the switch is a pressure operated switch.
25. The system of claim 23, wherein the switch is a position sensitive switch.
26. The system of claim 23, wherein the position sensitive switch is a mercury switch.
27. The system of claim 1, wherein each backscatter reader includes a data management module capable of reading tag data from different types of backscatter tags that are within signal reception range of the backscatter reader.
28. The system of claim 27, wherein the data management module converts tag data into a standard data stream and transmits the standard data stream to the computer.
29. The system of claim 1, wherein the backscatter reader includes data management modules that are interchangeable.
30. The system of claim 29, wherein each interchangeable data management module is adapted for receiving tag data from a specific type of tag.
31. The system of claim 29, wherein each interchangeable data management module is adapted for receiving tag data from a specific type of backscatter tag.
32. The system of claim 1, wherein the backscatter reader receives tag data from the backscatter tag only when the backscatter tag is within range of the backscatter reader.

33. The system of claim 1, wherein the tag transmits tag data to the reader automatically on a periodic basis.
34. The system of claim 1, wherein the tag data includes tag identification data.
35. The system of claim 1, wherein the tag data includes status, time and date information.
36. The system of claim 1, further comprising software running on the computer for generating an alert message when the sign is not in compliance with the particular advertising program.
37. The system of claim 36, wherein the alter message is at least one of an alert e-mail, a voicemail, and an Interactive Voice Recognition system.
38. The system of claim 1, further comprising software running on the computer for transmitting data from the reader in real time via a paging system, the data indicating that the sign is not in compliance with the particular advertising program.
39. The system of claim 1, wherein the backscatter tag is a long range backscatter tag.
40. The system of claim 1, wherein the backscatter reader includes antennae in a back-to-back arrangement.
41. The system of claim 1, wherein the backscatter reader includes antennae mounted for rotation about a fixed point.
42. The system of claim 1, wherein the backscatter reader includes a transmit antenna, a receive antenna and a rotating reflector.

43. The system of claim 1, wherein the backscatter reader includes two pairs of antennae in a generally "M" shaped arrangement, each adjacent pair of antennae being at obtuse angles to each other.

44. The system of claim 1, wherein the tag transmits an ID signal including a type of tag field, the field being a command understandable to the reader.

45. The system of claim 1, wherein the tag receives a location command that instructs the tag to provide a location signal.

46. The system of claim 1, wherein the reader receives a location command that instructs the reader to provide a location signal.

47. The system of claim 46, wherein the location signal is audible.

48. The system of claim 1, wherein data from the reader is transferred to a traveler tag.

49. A system for monitoring consumer exposure to specific advertising comprising:  
a sign located in a store;  
a consumer carried card having a tag embedded therein;  
a reader disposed adjacent the sign that receives tag data from the tag when the tag is within a predetermined range; and  
a computer that communicates with the reader to determine the number of consumers that pass within the predetermined range.

50. The system of claim 49, wherein the tag is one of a backscatter tag, a passive tag, an active tag, and a long range backscatter tag.

51. The system of claim 49, wherein the tag stores data including personal identification information about a consumer.
52. The system of claim 51, wherein the computer analyzes the tag data to determine how long the consumer is within the predetermined range of the reader.
53. A method of monitoring compliance with an advertising program comprising:  
associating a backscatter tag with a sign, the tag generating signals identifying the sign;  
using a backscatter reader to receive the generated signals from the tag; and  
determining whether the sign is located in a specified location in accordance with a particular advertising program.
54. The method of claim 53, further comprising transferring the generated signals to a remote device for storage and analysis.
55. The method of claim 53, further comprising:  
receiving tag signals of various power levels; and  
analyzing the various power levels received by the backscatter reader to determine variable distances between the backscatter tags and the backscatter reader.
56. The method of claim 53, further comprising detecting whether the sign is moved from the specified location.
57. The method of claim 53, further comprising fixedly placing the backscatter reader within a predetermined distance from the sign.

58. The method of claim 53, further comprising moving the tag and determining how far the backscatter reader is from the moved tag.

59. The method of claim 53, further comprising moving the backscatter reader and determining how far the tag is from the moved reader.

60. The method of claim 53, further including selecting the backscatter tag from the group consisting of:

- a contact tag with no internal power source that receives its power from a physical electrical contact;

- a passive tag with no internal power source that receives its power from an external source by capacitive or inductive coupling;

- an active tag having an internal power source; and

- a long range backscatter tag having an amplifier.

61. The method of claim 53, further comprising:

- grouping a plurality of signs in a predetermined area of a store;

- associating a backscatter tag with each sign; and

- using the backscatter reader to receive signals from each of the backscatter tags.

62. The method of claim 61, further including locating the backscatter reader above the group of signs.

63. The method of claim 53, further including generating a signal when the backscatter reader is moved from a predetermined location.



64. The method of claim 53, further including generating a signal when the backscatter tag is moved from a predetermined location.

65. The method of claim 53, further comprising:  
causing the backscatter reader to enter a sleep mode to conserve power; and  
awaking the backscatter reader periodically to look for a transmission from the backscatter tag.

66. The method of claim 53, further comprising:  
causing the backscatter tag to enter a sleep mode to conserve power; and  
awakening the backscatter tag periodically to transmit tag data.

67. The method of claim 66, wherein the tag data includes tag identification data.

68. The method of claim 66, further comprising processing the tag data to determine compliance with the particular advertising program.

69. The method of claim 53, further comprising:  
mounting the backscatter reader in a fixed location with respect to the sign;  
receiving signals from the backscatter tag within a predetermined range; and  
generating an alert signal if no signals are received from the tag for a specified period, the alert signal indicating that the sign has been moved from the specified location.

70. The method of claim 53, further comprising:  
moving the backscatter reader along an ascertainable route with respect to the sign;  
receiving signals from the backscatter tag within a predetermined range; and

generating an alert signal if no signals are received from the tag for a specified period, the alert signal indicating that the sign has been moved from the specified location.

71. An object positioned for viewing by the public and capable of being monitored for identification and location comprising:

identification indicia associated with the object;

means for converting the identification indicia to an electronic signal and for transmitting the electronic signal at a given RF power level such that the electronic signal is only detected within a predetermined distance; and

means for determining whether the object is located in a predetermined location.

72. The object of claim 71, wherein the identification indicia is selected from the group consisting of conductive ink, magnetic ink, optical indicia, and notch indicia.

73. The object of claim 71, wherein the converting means is an optical scanning device that reads the indicia.

74. The object of claim 71, wherein the identification indicia is stored in a EEPROM chip.

75. The object of claim 71, wherein the converting means is a contact tag.

76. The object of claim 71, wherein the converting means is a backscatter tag that transmits the electronic signal only when energized by an external source.

77. The object of claim 71, wherein the converting means is a backscatter tag that periodically transmits the electronic signal.

78. The object of claim 71, wherein the converting means is an active tag that transmits the electronic signal only when interrogated.

79. A system for monitoring compliance with an advertising program comprising:  
backscatter means for sending data associated with a sign placed in a location in accordance with a specific advertising program;  
receiving means for receiving the sign data; and  
analyzing means for communicating with the receiving means and for analyzing the sign data to determine whether the sign is in compliance with the specific advertising program.

80. The system of claim 79, wherein the sign includes a displayed price, and further comprising:  
means for monitoring the displayed price;  
means for sending the displayed price to the analyzing means; and  
means for determining whether the displayed price is in compliance with the specific advertising program.

81. The system of claim 79, further comprising means for determining the number of consumers that pass within a given distance from the sign.

82. The system of claim 79, further comprising:  
means associated with the sign for identifying the sign; and  
means for determining whether the sign is in the location required by the specific advertising program.

83. The system of claim 79, wherein:

the backscatter means is a contact tag;  
the receiving means is a backscatter reader; and  
the analyzing means is a computer.

84. A system for monitoring consumer exposure to specific advertising comprising:  
advertising means located in a store;  
backscatter means carried by a consumer;  
receiving means disposed adjacent the advertising means for receiving data from the  
backscatter means; and  
analyzing means for communicating with the receiving means and for determining how  
many consumers pass within a predetermined distance from the receiving means.

85. The system of claim 84, wherein:  
the backscatter means is a consumer carried card having a backscatter tag therein;  
the receiving means is a backscatter reader; and  
the analyzing means is a computer.

86. The system of claim 84, wherein the backscatter means includes personal identification  
information about the consumer.

87. A system for monitoring products on a shelf comprising:  
a product sensor that detects whether a product is present on the shelf;  
an RFID tag associated with at least one shelf, the tag storing tag data corresponding to  
whether a product is present on the shelf;  
a reader that receives the tag data from the tag; and  
a computer that receives the tag data and determines whether the shelf is empty.

88. The system of claim 87, wherein the product sensor includes conductors formed by conductive ink.
89. The system of claim 87, wherein the product sensor includes optical sensors.
90. The system of claim 87, wherein the product sensor includes a weight sensor.
91. The system of claim 87, wherein the product sensor includes an inductance sensor.
92. The system of claim 87, wherein the product sensor is connected to the RFID tag.
93. A system for monitoring products comprising:  
an RFID tag associated with at least one shelf, the at least one shelf including conductors formed by conductive ink; and  
a product including conductive ink that makes an electrical connection between at least two of the conductors to form a closed circuit.
94. The system of claim 93, wherein the tag detects the resistance across at least two of the conductors.
95. The system of claim 93, wherein the resistance indicates the presence of the product.
96. The system of claim 93, further including a reader that receives tag data from the tag.
97. A method of calibrating an RFID tag reader comprising:  
locating a calibration tag a specified distance from the reader;  
initiating an automatic calibration process wherein the reader adjusts its output power and determines whether it can detect the calibration tag; and

determining the minimum output power required to detect the tag at the specified distance.

98. The method of claim 97, further comprising:

locating the calibration tag a second specified distance from the reader;

initiating an automatic calibration process wherein the reader adjusts its output power and determines whether it can detect the calibration tag; and

determining the minimum output power required to detect the tag at the second specified distance.

99. The method of claim 97, further comprising producing an indication signal when the automatic calibration process is complete for the specified distance.